

CLAIMS:

- 5 1. A method of determining total left ventricular (LV) interior volume during a cardiac cycle from a cardiac cine series, said method comprising the steps of:
delineating endocardial and epicardial contours of a left ventricle in all slices
of said cine series at end-diastole (ED),
applying the endocardial contours delineated at ED to all phases of the cardiac
10 cycle, and
calculating the total LV interior volume based on intensity values inside the
endocardial contours delineated at ED.
- 15 2. The method according to claim 1, further comprising calculating a mean
intensity for myocardium and blood voxels at ED based on the delineated endocardial and
epicardial contours.
- 20 3. The method according to claim 2, further comprising using the mean
intensities for compensating for myocardium enclosed in the endocardial contours delineated
at ED during subsequent phases of the cardiac cycle.
4. The method according to claim 3, wherein the LV interior volume is
calculated as
- $$V_{LV} = \sum_{i=1}^n V_{ED,i} \frac{I_{T,i}}{I_{T,ED}}, \text{ wherein}$$
- 25 n is the total number of slices comprising the LV total interior volume,
 $V_{ED,i}$ is the calculated interior volume of slice number i of the LV at end-
diastole of the LV,
 $I_{T,i}$ is the detected intensity of slice i within the endocardial delimitation, and
 $I_{T,ED}$ is the total intensity at ED.

5. The method according to any of the preceding claims, wherein the cine series is a short-axis study of the heart consisting of multiple slices covering at least the left ventricle and multiple phases within the cardiac cycle.
- 5 6. The method according to any of the preceding claims, further comprising determining the LV volume from cine sequences acquired at different stress levels, whereby the temporal behaviour of the heart as a function of increasing stress is determined.
7. The method according to any of the preceding claims, wherein said cine series
10 is/are captured previously to said method on a device for imaging inside parts of a mammal body.
8. The method according to claim 7, wherein said device for imaging inside parts of a mammal body is a Magnetic Resonance (MR), Computer Tomography (CT), Nuclear
15 Medicine (NM) or Ultrasound (US) device.
9. The method according to claim 8, wherein an MRI study comprises Steady State Free Precession (SSFP) images.
- 20 10. The method according to any of the preceding claims, further comprising compensating motion of the heart.
11. A computer-readable medium (90) having embodied thereon a computer program for processing by a computer (91) for calculating total left ventricular (LV) volume
25 during a cardiac cycle from a cine series, the computer program comprising:
a first code segment (92) for delineating endocardial and epicardial contours of a left ventricle in all slices of said cine series at end-diastole (ED),
a second code (93) segment for applying the endocardial contours delineated at ED to all phases of the cardiac cycle, and
30 a third code segment (94) for calculating the total LV volume based on intensity values inside the endocardial contours delineated at ED.
12. The computer-readable medium according to claim 11, wherein said first code segment automatically delineates the endocardial and epicardial contours.